

CLAIMS

1. An essentially ceramic target for a sputtering device, especially for magnetically enhanced sputtering, said target comprising predominantly nickel oxide, **characterized in that** the nickel oxide is oxygen-deficient with respect to the stoichiometric composition.
2. The target as claimed in claim 1, **characterized in that** the stoichiometric deficiency stems from the composition of the intimate blend formed by nickel oxide powders and nickel powders.
3. The target as claimed in either of claims 1 and 2, **characterized in that** x is strictly less than 1.
4. The target as claimed in one of claims 1 to 3, **characterized in that** the target has an electrical resistivity of less than 10 ohm.cm, preferably less than 1 ohm.cm, and more preferably less than 0.1 ohm.cm.
5. The target as claimed in one of claims 1 to 4, **characterized in that** the nickel oxide is alloyed to a minority element.
6. The target as claimed in claim 5, **characterized in that** the atomic percentage of the minority element is less than 50%, preferably less than 30% and even more preferably still less than 20%, calculated with respect to the nickel.
7. The target as claimed in either of claims 5 and 6, **characterized in that** the minority element is a material whose oxide is an electroactive material with anodic coloration.

8. The target as claimed in claim 7, **characterized in that** the minority element is chosen from Co, Ir, Ru, and Rh.
- 5 9. The target as claimed in claim 5 or 6, **characterized in that** the minority element is a material whose oxide is an electroactive material with cathodic coloration.
- 10 10. The target as claimed in claim 9, **characterized in that** the minority element is chosen from Mo, W, Re, Sn, In, and Bi or a mixture of these elements.
- 15 11. The target as claimed in claim 5 or 6, **characterized in that** the minority element is chosen from the elements belonging to the column one of the Periodic Table.
- 20 12. The target as claimed in claim 11, **characterized in that** the minority element is chosen from H, Li, K, and Na.
- 25 13. The target as claimed in claim 5 or 6, **characterized in that** the minority element is a metal or an alkaline earth or a semiconductor, the hydrated or hydroxylated oxide of which is protonically conductive.
- 30 14. The target as claimed in claim 13, **characterized in that** the minority element is chosen from Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, and Y or a mixture of these elements.
- 35 15. A process for manufacturing a thin layer based on nickel oxide by magnetically enhanced sputtering, **characterized in that** it uses a ceramic target as claimed in any one of claims 1 to 14.

16. Use of the process as claimed in claim 15 for producing an electrochromic material having anodic coloration as a thin layer based on nickel oxide.

5 17. An electrochemical device comprising at least one carrier substrate provided with a stack of functional layers, including at least one electrochemically active layer, capable of reversibly and simultaneously inserting ions, of the H^+ , Li^+ or OH^- type, and
10 electrons, **characterized in that** said electrochemically active layer is based on nickel oxide obtained by the process as claimed in claim 15 and/or from a target as claimed in one of claims 1 to 14.

15 18. The electrochemical device comprising at least one carrier substrate provided with a stack of functional layers, including at least one electrochemically active layer, capable of reversibly and simultaneously inserting ions, of the H^+ , Li^+ or OH^- type, and
20 electrons, **characterized in that** said electrochemically active layer is based on nickel oxide, said layer being alloyed with a minority element consisting of a material whose oxide is an electroactive material with anodic coloration, especially chosen from Co, Ir, Ru,
25 and Rh or a mixture of these elements, said layer being obtained from a target as claimed in any one of claims 1 to 8.

30 19. The electrochemical device comprising at least one carrier substrate provided with a stack of functional layers, including at least one electrochemically active layer, capable of reversibly and simultaneously inserting ions, of the H^+ , Li^+ or OH^- type, and
electrons, **characterized in that** said electrochemically
35 active layer is based on nickel oxide, said layer being alloyed with a minority element consisting of a material whose oxide is an electroactive material with anodic coloration, especially chosen from Mo, W, Re, Sn, In, and Bi or a mixture of these elements, said

layer being obtained from a target as claimed in any one of claims 1 to 6 and 9 to 10.

20. The electrochemical device comprising at least one
5 carrier substrate provided with a stack of functional
layers, including at least one electrochemically active
layer, capable of reversibly and simultaneously
inserting ions, of the H^+ , Li^+ or OH^- type, and
electrons, **characterized in that** said electrochemically
10 active layer is based on nickel oxide, said layer being
alloyed with a minority element chosen from the
elements belonging to the column one of the Periodic
Table, especially chosen from H, Li, K, and Na or a
mixture of these elements, said layer being obtained
15 from a target as claimed in any one of claims 1 to 6
and 11 to 12.

21. The electrochemical device comprising at least one
carrier substrate provided with a stack of functional
20 layers, including at least one electrochemically active
layer, capable of reversibly and simultaneously
inserting ions, of the H^+ , Li^+ or OH^- type, and
electrons. **characterized in that** said electrochemically
active layer is a metal or an alkaline earth or a
25 semiconductor, the hydrated or hydroxylated oxide of
which is protonically conducted, especially chosen from
Ta, Zn, Zr, Al, Si, Sb, U, Be, Mg, Ca, V, and Y or a
mixture of these elements, said layer being obtained
from a target as claimed in any one of claims 1 to 6
30 and 13 to 14.

22. The use of the electrochemical device as claimed
in any one of claims 17 to 21 to form part of
electrochromic glazing, especially for buildings or for
35 means of locomotion of the train, airplane or car type,
to form part of display screens or to form part of
electrochromic mirrors.